



EXCERPT FROM THE PROCEEDINGS

OF THE TENTH ANNUAL ACQUISITION RESEARCH SYMPOSIUM ACQUISITION MANAGEMENT

Capturing Creative Program Management Best Practices

Brandon Keller and J. Robert Wirthlin
Air Force Institute of Technology

Published April 1, 2013

Approved for public release; distribution is unlimited.
Prepared for the Naval Postgraduate School, Monterey, CA 93943.

Disclaimer: The views represented in this report are those of the authors and do not reflect the official policy position of the Navy, the Department of Defense, or the federal government.



ACQUISITION RESEARCH PROGRAM
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY
NAVAL POSTGRADUATE SCHOOL

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 01 APR 2013		2. REPORT TYPE		3. DATES COVERED 00-00-2013 to 00-00-2013	
4. TITLE AND SUBTITLE Capturing Creative Program Management Best Practices				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Air Force Institute of Technology, Wright Patterson AFB, OH, 45433				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT This research attempted to capture the creative aspects of government program management in three specific areas: efficiently navigating oversight, capturing the intent of regulations, and developing innovative risk management practices. Respected acquisition leaders with diverse backgrounds and experiences were interviewed with ranks ranging from 0-6 to 0-8 and GS-15 to SES. Several contractor interviews were conducted for specific purposes. The data were iteratively coded and analyzed using ATLAS.ti. The results were categorized into four themes, each with three sub-elements. Differences between respondents with program director experience and those with rapid acquisition experience are discussed. A survey was then distributed to the interviewees and junior acquisition professionals. The predominant research finding is that senior acquisition professionals believe that relationship-building is of paramount importance. This, along with creative practices regarding how to externally communicate program strategies, greatly increases the probability of successfully navigating oversight and obtaining waivers or tailoring regulations. Various risk management techniques and management reserve techniques are presented. In addition, knowledge gaps between the junior acquisition workforce and senior leaders were identified based on statistical significance and corrective actions recommended where applicable. Reports and outbriefs were developed, tailored to each class, to relay these creative practices to junior acquisition professionals.					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 26	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

The research presented in this report was supported by the Acquisition Research Program of the Graduate School of Business & Public Policy at the Naval Postgraduate School.

To request defense acquisition research, to become a research sponsor, or to print additional copies of reports, please contact any of the staff listed on the Acquisition Research Program website (www.acquisitionresearch.net).



ACQUISITION RESEARCH PROGRAM
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY
NAVAL POSTGRADUATE SCHOOL

Preface & Acknowledgements

Welcome to our Tenth Annual Acquisition Research Symposium! We regret that this year it will be a “paper only” event. The double whammy of sequestration and a continuing resolution, with the attendant restrictions on travel and conferences, created too much uncertainty to properly stage the event. We will miss the dialogue with our acquisition colleagues and the opportunity for all our researchers to present their work. However, we intend to simulate the symposium as best we can, and these *Proceedings* present an opportunity for the papers to be published just as if they had been delivered. In any case, we will have a rich store of papers to draw from for next year’s event scheduled for May 14–15, 2014!

Despite these temporary setbacks, our Acquisition Research Program (ARP) here at the Naval Postgraduate School (NPS) continues at a normal pace. Since the ARP’s founding in 2003, over 1,200 original research reports have been added to the acquisition body of knowledge. We continue to add to that library, located online at www.acquisitionresearch.net, at a rate of roughly 140 reports per year. This activity has engaged researchers at over 70 universities and other institutions, greatly enhancing the diversity of thought brought to bear on the business activities of the DoD.

We generate this level of activity in three ways. First, we solicit research topics from academia and other institutions through an annual Broad Agency Announcement, sponsored by the USD(AT&L). Second, we issue an annual internal call for proposals to seek NPS faculty research supporting the interests of our program sponsors. Finally, we serve as a “broker” to market specific research topics identified by our sponsors to NPS graduate students. This three-pronged approach provides for a rich and broad diversity of scholarly rigor mixed with a good blend of practitioner experience in the field of acquisition. We are grateful to those of you who have contributed to our research program in the past and encourage your future participation.

Unfortunately, what will be missing this year is the active participation and networking that has been the hallmark of previous symposia. By purposely limiting attendance to 350 people, we encourage just that. This forum remains unique in its effort to bring scholars and practitioners together around acquisition research that is both relevant in application and rigorous in method. It provides the opportunity to interact with many top DoD acquisition officials and acquisition researchers. We encourage dialogue both in the formal panel sessions and in the many opportunities we make available at meals, breaks, and the day-ending socials. Many of our researchers use these occasions to establish new teaming arrangements for future research work. Despite the fact that we will not be gathered together to reap the above-listed benefits, the ARP will endeavor to stimulate this dialogue through various means throughout the year as we interact with our researchers and DoD officials.

Affordability remains a major focus in the DoD acquisition world and will no doubt get even more attention as the sequestration outcomes unfold. It is a central tenet of the DoD’s Better Buying Power initiatives, which continue to evolve as the DoD finds which of them work and which do not. This suggests that research with a focus on affordability will be of great interest to the DoD leadership in the year to come. Whether you’re a practitioner or scholar, we invite you to participate in that research.

We gratefully acknowledge the ongoing support and leadership of our sponsors, whose foresight and vision have assured the continuing success of the ARP:



- Office of the Under Secretary of Defense (Acquisition, Technology, & Logistics)
- Director, Acquisition Career Management, ASN (RD&A)
- Program Executive Officer, SHIPS
- Commander, Naval Sea Systems Command
- Program Executive Officer, Integrated Warfare Systems
- Army Contracting Command, U.S. Army Materiel Command
- Office of the Assistant Secretary of the Air Force (Acquisition)
- Office of the Assistant Secretary of the Army (Acquisition, Logistics, & Technology)
- Deputy Director, Acquisition Career Management, U.S. Army
- Office of Procurement and Assistance Management Headquarters, Department of Energy
- Director, Defense Security Cooperation Agency
- Deputy Assistant Secretary of the Navy, Research, Development, Test, & Evaluation
- Program Executive Officer, Tactical Aircraft
- Director, Office of Small Business Programs, Department of the Navy
- Director, Office of Acquisition Resources and Analysis (ARA)
- Deputy Assistant Secretary of the Navy, Acquisition & Procurement
- Director of Open Architecture, DASN (RDT&E)
- Program Executive Officer, Littoral Combat Ships

James B. Greene Jr.
Rear Admiral, U.S. Navy (Ret.)

Keith F. Snider, PhD
Associate Professor



Acquisition Management

Naval Ship Maintenance: An Analysis of the Dutch Shipbuilding Industry Using the Knowledge Value Added, Systems Dynamics, and Integrated Risk Management Methodologies

David N. Ford, Thomas J. Housel, and Johnathan C. Mun
Naval Postgraduate School

Time as an Independent Variable: A Tool to Drive Cost Out of and Efficiency Into Major Acquisition Programs

J. David Patterson
National Defense Business Institute, University of Tennessee

The Impact of Globalization on the U.S. Defense Industry

Jacques S. Gansler and William Lucyshyn
University of Maryland

Bottleneck Analysis on the DoD Pre-Milestone B Acquisition Processes

Danielle Worger and Teresa Wu, *Arizona State University*
Eugene Rex Jalao, *Arizona State University and University of the Philippines*
Christopher Auger, Lars Baldus, Brian Yoshimoto, J. Robert Wirthlin, and John Colombi, *The Air Force Institute of Technology*

Software Acquisition Patterns of Failure and How to Recognize Them

Lisa Brownsword, Cecilia Albert, Patrick Place, and David Carney
Carnegie Mellon University

Fewer Mistakes on the First Day: Architectural Strategies and Their Impacts on Acquisition Outcomes

Linda McCabe and Anthony Wicht
Massachusetts Institute of Technology

The Joint Program Dilemma: Analyzing the Pervasive Role That Social Dilemmas Play in Undermining Acquisition Success

Andrew P. Moore, William E. Novak, Julie B. Cohen, Jay D. Marchetti, and Matthew L. Collins
Software Engineering Institute, Carnegie Mellon University

Acquisition Risks in a World of Joint Capabilities: A Study of Interdependency Complexity



Mary Maureen Brown
University of North Carolina Charlotte

Leveraging Structural Characteristics of Interdependent Networks to Model Non-Linear Cascading Risks

Anita Raja, Mohammad Rashedul Hasan, and Shalini Rajanna
University of North Carolina at Charlotte
Ansaf Salieb-Aoussi, *Columbia University, Center for Computational Learning Systems*

Lexical Link Analysis Application: Improving Web Service to Acquisition Visibility Portal

Ying Zhao, Shelley Gallup, and Douglas MacKinnon
Naval Postgraduate School

Capturing Creative Program Management Best Practices

Brandon Keller and J. Robert Wirthlin
Air Force Institute of Technology

The RITE Approach to Agile Acquisition

Timothy Boyce, Iva Sherman, and Nicholas Roussel
Space and Naval Warfare Systems Center Pacific

Challenge-Based Acquisition: Stimulating Innovative Solutions Faster and Cheaper by Asking the Right Questions

Richard Weatherly, Virginia Wydler, Matthew D. Way, Scott Anderson, and Michael Arendt
MITRE Corporation

Defense Acquisition and the Case of the Joint Capabilities Technology Demonstration Office: Ad Hoc Problem Solving as a Mechanism for Adaptive Change

Kathryn Aten and John T. Dillard
Naval Postgraduate School

A Comparative Assessment of the Navy's Future Naval Capabilities (FNC) Process and Joint Staff Capability Gap Assessment Process as Related to Pacific Command's (PACOM) Integrated Priority List Submission

Jaime Frittman, Sibel McGee, and John Yuhas, *Analytic Services, Inc.*
Ansaf Salieb-Aoussi, *Columbia University*

Enabling Design for Affordability: An Epoch-Era Analysis Approach

Michael A. Schaffner, Marcus Wu Shihong, Adam M. Ross, and Donna H. Rhodes
Massachusetts Institute of Technology



Measuring Dynamic Knowledge and Performance at the Tactical Edges of Organizations: Assessing Acquisition Workforce Quality

Mark E. Nissen
Naval Postgraduate School

Outcome-Focused Market Intelligence: Extracting Better Value and Effectiveness From Strategic Sourcing

Timothy G. Hawkins, *Naval Postgraduate School*
Michael E. Knipper, *771 Enterprise Sourcing Squadron USAF*
Timothy S. Reed, *Beyond Optimal Strategic Solutions*



Capturing Creative Program Management Best Practices¹

Brandon Keller—Capt Keller, USAF, is an MS student in R&D management at AFIT. Upon completing his undergraduate degree from the University of Pittsburgh, he served as a program manager in the GPS OCX program, a \$1 billion software-centric ground control system. He then held a staff job for the GPS Director, leading contractor performance assessment processes and various staff duties. His research interests include defense acquisition reform and program management oversight. [brandon.keller@afit.edu]

J. Robert Wirthlin—Lt Col Wirthlin, USAF, is an assistant professor of engineering systems at AFIT. A graduate of the U.S. Air Force Academy, his MS and PhD are from MIT. He is a member of INCOSE, AIAA, and the Design Society. Research interests include acquisition, engineering management, risk, and lean. Previously, he has been a systems engineer and a program manager at Hill AFB, Los Angeles AFB, and Buckley AFB. [joseph.wirthlin@afit.edu]

Abstract

This research attempted to capture the creative aspects of government program management in three specific areas: efficiently navigating oversight, capturing the intent of regulations, and developing innovative risk management practices. Respected acquisition leaders with diverse backgrounds and experiences were interviewed with ranks ranging from 0-6 to 0-8 and GS-15 to SES. Several contractor interviews were conducted for specific purposes. The data were iteratively coded and analyzed using ATLAS.ti. The results were categorized into four themes, each with three sub-elements. Differences between respondents with program director experience and those with rapid acquisition experience are discussed. A survey was then distributed to the interviewees and junior acquisition professionals. The predominant research finding is that senior acquisition professionals believe that relationship-building is of paramount importance. This, along with creative practices regarding how to externally communicate program strategies, greatly increases the probability of successfully navigating oversight and obtaining waivers or tailoring regulations. Various risk management techniques and management reserve techniques are presented. In addition, knowledge gaps between the junior acquisition workforce and senior leaders were identified based on statistical significance and corrective actions recommended where applicable. Reports and outbriefs were developed, tailored to each class, to relay these creative practices to junior acquisition professionals.

Introduction

This paper presents the results of exploratory thesis research regarding creative program management practices as identified by senior leaders. For the purposes of this paper, *creative* is defined as any innovative, resourceful, uncommon, or out-of-the-box thinking and practices leading to efficient and effective program management without jeopardizing integrity, ethics, or laws. The literature review identified three areas of investigation:

- Topic 1: How to creatively reduce non value-added oversight
- Topic 2: How to creatively capture the *intent* of regulations
- Topic 3: Creative practices of resource-loaded risk management

The first two topics are the focus of this paper because they led to the overarching findings. Interviews with respected, leading practitioners representing diverse programs with

¹ This study is an original product developed from thesis research conducted at the Air Force Institute of Technology (AFIT) in partial fulfillment of a Master of Science in Research and Development Management. This research has not been previously published and is not under consideration by another journal for publication.



varying sizes and complexity were conducted. A survey was then distributed to government acquisitions personnel, further validating interview findings with quantitative data, as well as prioritizing responses from senior leaders and identifying the major differences in the junior workforce.

Literature Review

Perhaps the greatest impediment to the achievement of high quality—and productivity—is ... burgeoning bureaucracy.
(Augustine, 1997, p. 79)

The type of oversight described in this paper must be defined because “oversight” can have various meanings based on the reader’s experiences. For the purposes of this research, oversight consists of the organizations and people needed to approve (either formally or informally) a program’s approach and/or documentation to proceed to the next phase in the acquisition life cycle. This is separate from government oversight of contractors or prime contractor oversight of subcontractors. This research is not meant to make judgments as to the goodness of oversight or to assess the theory of checks and balances versus optimal efficiency. The goal is to identify creative ways in which DoD acquisition oversight can be made more beneficial or, in situations when oversight is overly cumbersome, how it can be effectively navigated with minimal effort.

Setting the Stage: Extensive Oversight—A Serious Issue

Acquisition oversight began in the 1960s (Acker, 1993). Numerous studies and reports on defense acquisition have subsequently been conducted over the past five decades. A common theme extracted from these reports is that a serious problem exists with extensive, non-required, and, many times, non value-added oversight. One panel of experts estimated the cost of oversight in Air Force programs to be as high as \$94 million (Neal, 2004). Knue’s (1991) thesis is recommended as a detailed source for explaining oversight of and within the DoD. Additionally, several case studies exist on oversight within Air Force programs. A few of the more prominent reports are summarized in the following paragraphs.

Miller and Williams (1993) conducted a case study of oversight in the C-17 program. The interviews they conducted revealed that oversight had a negative effect on program management and morale. There was “absolute certainty in the collective consciousness” of members of the C-17 program office that a link exists between oversight and its effect on cost and schedule performance (Knue, 1991, p. 72). Interviewees also cited external (outside the chain of command) sources of oversight from nine distinct organizations that negatively affected the program. These nine external sources did not include legislative, executive, and media oversight (Miller & Williams, 1993).

A RAND study of the B-1B bomber program concluded that an extraordinary amount of internal and external coordination was required, leading to a “ceaseless series of meetings, calls, and memos” (Bodilly, 1993, p. 40). The study concluded that 14 different groups had major roles in the program.

The *Beyond Goldwater-Nichols* Phase 2 Report (Murdock et al., 2005) stated that the “well-intentioned majority of the acquisition corps today faces two significant types of bureaucratic impediments: highly centralized oversight and conflicting guidance” (p. 91). The Phase 2 Report also found that program managers (PMs) and program executive officers (PEOs) are left with about 50% or less of their time to actually manage their programs (Murdock et al., 2005).



The highly regarded Defense Acquisition Performance Assessment (DAPA) report in 2006 showed that 97% of the survey inputs received indicated that the current oversight and leadership process is deficient (Kadish et al., 2006). Figure 1, from the DAPA report, highlights the key issues affecting government acquisitions. As can be seen in the figure, respondents viewed oversight as the most prevalent issue.

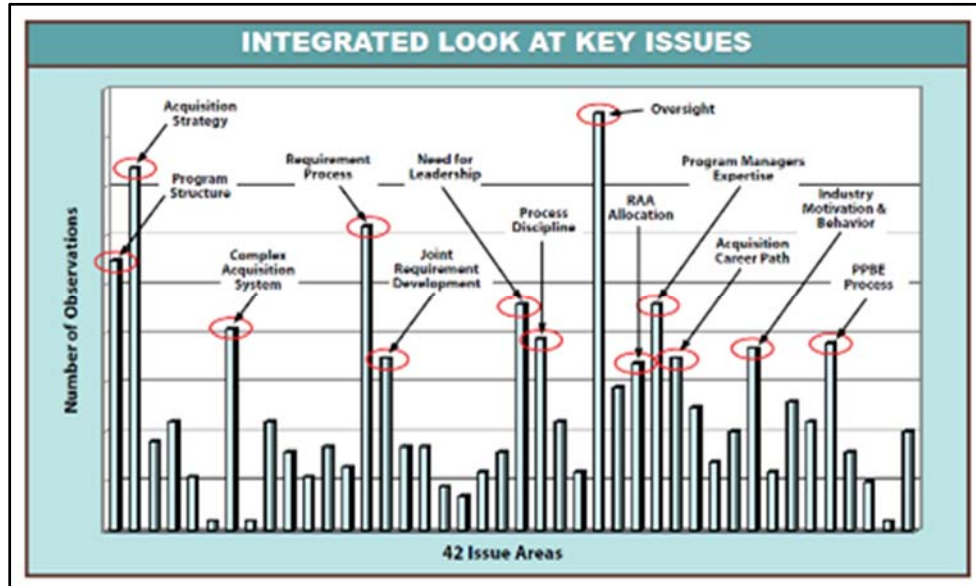


Figure 1. Integrated Look at Key Issues
(Kadish et al., 2006)

Oversight is discussed in several sections of the DAPA report. Figure 2 is a one-page summary of the myriad DAPA findings with respect to oversight. Issues relating to oversight are divided into four categories: Extent of Oversight, Programmatic Issues, Accountability/Authority Issues, and Effect on Progress.

Extent of oversight

- Current oversight process is burdensome, ineffective, adds little value, and inhibits steady improvement
- Excessive numbers of reviews and oversight personnel; quantity replaced quality
- Regulations written to implement policy are more stringent than the policy itself
- Dissatisfaction with sheer volume of acquisition laws, regulations, and policies
- Rely on overlapping layers of reviews at the expense of focus and quality

Programmatic Issues

- Acquisition Category (ACAT) designation process results in excessive number of programs requiring additional level of DAB approvals, causing excessive reporting requirements
- Even with the laborious and extensive oversight, troubled programs still pass through
- Lack of continuity or attendance on OSD acquisition IPTs results in the re-emergence of issues previously resolved and revisiting decisions
- Policy and guidance often conflict, resulting in ignoring policy or seeking legal advice
- Institutional biases toward waiving or tailoring regulations (even though DoD Directives promote tailoring for each program's situation)

Accountability/Authority Issues

- Oversight is preferred to accountability and based on a lack of trust
- Oversight dilutes or eliminates accountability for program performance
- PMs effectiveness is constrained by people who do not share responsibility or accountability
- OSD staff do not have decision-making authority or timely access to principal decision makers
- None of the review bodies are accountable for the impact of the changes they imposed

Progress Suffers

- Staffs allowed to assume de-facto program authority, stop progress and increase program scope
- Programs advance in spite of the oversight process rather than because of it
- PM does not have authority to bypass a stakeholders "no" vote, programs progress held hostage

Figure 2. Summary of DAPA Report Findings on Oversight
(extracted from Kadish et al., 2006)

Lastly, Ford, Colburn, and Morris (2012) found that large programs and budgets, such as acquisition category (ACAT) 1 multi-year programs, are easy targets for increased



oversight and longer approval chains. They showed a positive correlation between program size (measured by budget dollars) and the extent of oversight.

Factors Affecting the Level of Oversight

A factor affecting one's ability to manage oversight and stakeholders is political skill. Political skills include developing coalitions and gaining resources, assistance, and approvals from senior leaders and other relevant parties (Yukl, 2006). Additionally, De Wit (1988, p. 167) stated, "political skill will be a useful attribute on the part of the project manager to assure maximum satisfaction among the stakeholders. This is of special importance on public-sector projects." Furthermore, Yukl (2006) discusses five skills required for leading cross-functional teams (which includes integrated product teams [IPTs]). Specifically, political and interpersonal skills are associated with managing oversight and leading IPTs (Yukl, 2006). These skills involve understanding the needs and values of stakeholders to influence them and resolve conflict. In addition, a higher program classification can reduce oversight because it limits the number of people to those with the requisite security classification and need to know (Ford, Colburn, & Morris, 2012).

Finally, the literature on DoD acquisitions points to four main areas that affect oversight (Pagliano & O'Rourke, 2004; Kadish et al, 2006). The first factor affecting oversight is uncertainty. If all else is constant, the greater the program uncertainty, the more extensive the oversight will be. Second, oversight will increase as program criticality increases. In other words, if a program is critical to national security, a high degree of oversight will exist. Third, oversight will increase as trust decreases. If the chain of command and external stakeholders do not have a high degree of trust in what the program office is doing, more external reviews and proof will be required from the program office, thus leading to more extensive oversight. Finally, oversight will increase as the level of control and standardization from leaders increases. A model was developed (Figure 3) from the review showing how various factors affect the level of oversight in a program.

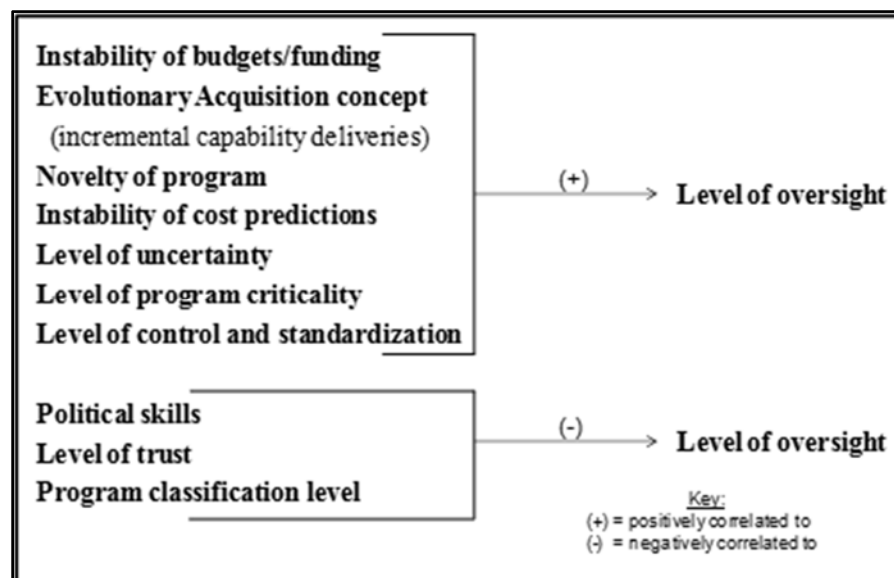


Figure 3. Factors Affecting Level of Oversight

Methodology

Research Design

Theoretical Method

This research utilized Grounded Theory Methods (GTM). Auerbach and Silverstein (2003) suggest GTM when a researcher's particular theory is at its early stage, not enough is known to state hypotheses prior to the investigation, and the major research involves identifying and categorizing elements to explore their connections. One of the key tenets of GTM is the iterative process of collecting, coding, and interpreting the data, also known as analytic induction (Binder & Edwards, 2010). As such, the interview process and data analysis were iterative in nature.

Sample Size

For the interview sample size, Eisenhardt (1989) states that 4–10 cases have worked well for most qualitative studies. Separate research conducted by Ellram (1996) identifies 6–10 cases as sufficiently large for evaluation and empirical grounding. Therefore, one-on-one interviews were conducted with 10 hand-picked senior acquisition leaders with diverse backgrounds and program experience.

Sampling Strategy

Eisenhardt (1989, p. 537) states that “random [case] selection is neither necessary, nor preferable” when building theory from case studies. Both purposive and snowball sampling were used in this research. Purposive sampling is used in qualitative research where individuals are selected based on their ability to better inform the researcher (Krathwohl, 1998; Patten, 2009). Snowball sampling entails identifying future participants based on recommendations from past participants (Krathwohl, 1998). In other words, the interviewees specifically suggest other people to interview. Snowball sampling successfully led to three interviews.

Personal Interviews

The population for this research consisted of Air Force program managers (PMs) with at least 20 years of experience. This included active duty and retired officers with ranks ranging from colonel to major general, active duty civilians with ranks ranging from GS-15 to Senior Executive Service (SES), and three government contractors. Both Air Force product centers, the Life Cycle Management Center (AFLCMC) and Space and Missile Systems Center (SMC), were represented, along with Special Operations Command (SOCOM). Programs covered included Global Positioning System (GPS), SOCOM Fixed Wing, Spacelift Range, Big Safari, F-22, Project Dragon Spear, Military Satellite Communications Directorate (MILSATCOM), FalconSAT, and the Secretary of the Air Force for Acquisition (SAF/AQ) and Aerospace organizations.

Coding: Atlas.ti

The ExpressScribe program was used to quickly transfer the interviews into Microsoft Word documents. The interviews were then coded, categorized, and analyzed in ATLAS.ti, a software program specifically designed for qualitative research, using an “open coding” of labels to extract major themes. All responses were analyzed for common themes. Three rounds of analysis were conducted in ATLAS.ti.

Survey

Additionally, a survey was developed from the interview data and distributed to the interviewees as well as junior officers and civilians in the introductory Fundamentals of Acquisition Management (FAM) 103 and mid-level Intermediate Program Management



(IPM) 301 skills courses. The survey contained 65 questions on a 1–5 Likert scale with an additional column for respondents to mark “unknown.” Two classes from each course were surveyed. Fifty-eight students in the FAM 103 courses and 35 students in the IPM 301 courses provided usable surveys, totaling 93. The survey served three purposes:

1. Quantitatively validate interview responses with statistical significance
2. Prioritize themes from senior leaders
3. Identify knowledge gaps in the junior workforce

According to Cohen (1992), for an alpha (α) level of 0.05 (a 95% confidence level) and a medium effect size, one must have a sample size of at least 85. For a large effect size at the same confidence level, the sample size should be at least 28. Therefore, a conservative sample size of at least 85 was the goal; 93 usable student surveys were completed along with the additional 10 from the senior leaders.

Limitations/Assumptions

The nature of qualitative data and grounded theory research allows for interpretation depending on the researcher’s point of view. Qualitative analysis “can therefore become biased based on individual experience and perspective” (Ford et al., 2012). The author endeavored to be cognizant of bias and avoid it when guiding interview discussions and interpreting, coding, and analyzing the data.

The results will have a high degree of reliability for all DoD program managers, even though the population set was limited to Air Force program managers. Studies have shown that all the Services are comparable with respect to their acquisition processes and record of success (Kadish et al., 2006; Burton, 1993).

Analysis and Results

Interview Analysis

From three iterative rounds of coding the data, four themes and 12 sub-elements emerged as shown in Figure 4.



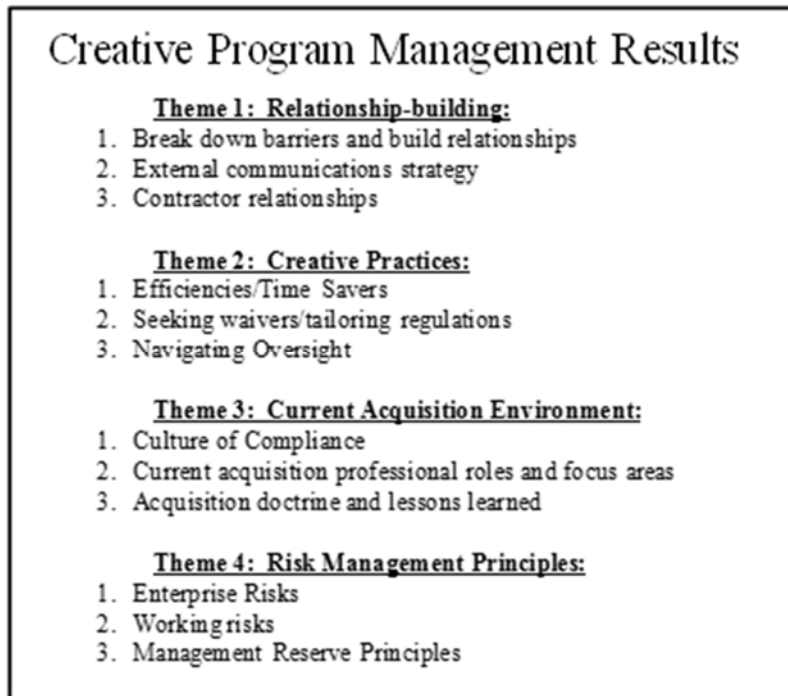


Figure 4. ATLAS.ti Round 3 Results

A co-occurrence table was developed analyzing where common occurrences within and between themes and codes occurred. The strength of a co-occurrence is affected by the number of times a comment was made either during a single interview or between several interviews. Strong and medium co-occurrences are collected and displayed in Table 1, with the three key findings for this paper highlighted.

Table 1. Strong and Medium Co-Occurrences Between Sub-Elements

Strong Co-occurrences		
Break down barriers & build relationships	strongly co-occurs with	External communications strategy
Break down barriers & build relationships	strongly co-occurs with	Navigating oversight
Medium Co-occurrences		
Break down barriers & build relationships	co-occurs with	Contractor relationships
Break down barriers & build relationships	co-occurs with	Seeking waivers/tailoring regulations
External communications strategy	co-occurs with	Efficiencies/time savers
External communications strategy	co-occurs with	Seeking waivers/tailoring regulations
External communications strategy	co-occurs with	Navigating oversight
Efficiencies/time savers	co-occurs with	Navigating oversight
Enterprise risks	co-occurs with	Working risks
Working risks	co-occurs with	Management reserve principles

The interviews were also categorized based on the respondents with experience as a program director (PD) and those with experience in rapid acquisitions. Five interviews were coded as those with PD experience and three interviews were coded as those with rapid acquisition experience. Figure 5 graphically displays the focus areas between the two

groups. Interestingly, the top three responses were the same for both groups. These were the External Communications Strategy, Break Down Barriers and Build Relationships, and Navigating Oversight. The main focus area for the program directors regarded their external communications strategies, which is understandable given the amount of oversight and number of stakeholders present in MDAP programs. A great deal of time is spent ensuring goals and strategies are being communicated clearly, accurately, and in a timely manner across organizational boundaries. Navigating Oversight was the second focus area for both program directors and those with rapid acquisition experience. However, a key difference exists between the two groups. Program directors' practices relating to oversight involved how to efficiently and effectively work through the current oversight and regulations. The oversight was viewed more as a fact of life that had to be worked through. In contrast, rapid acquisition responses focused more on how to circumvent the oversight from the start. In other words, rather than trying to efficiently work through oversight, rapid acquisition organizations delegate approvals and obtain waivers from the beginning (the thesis contains a case study on how USSOCOM instantly tailors 5000.02 via SOCOM Directive 70-1). Accepting the oversight level and figuring out how best to navigate it is very different than navigating oversight by avoiding the oversight from the beginning.

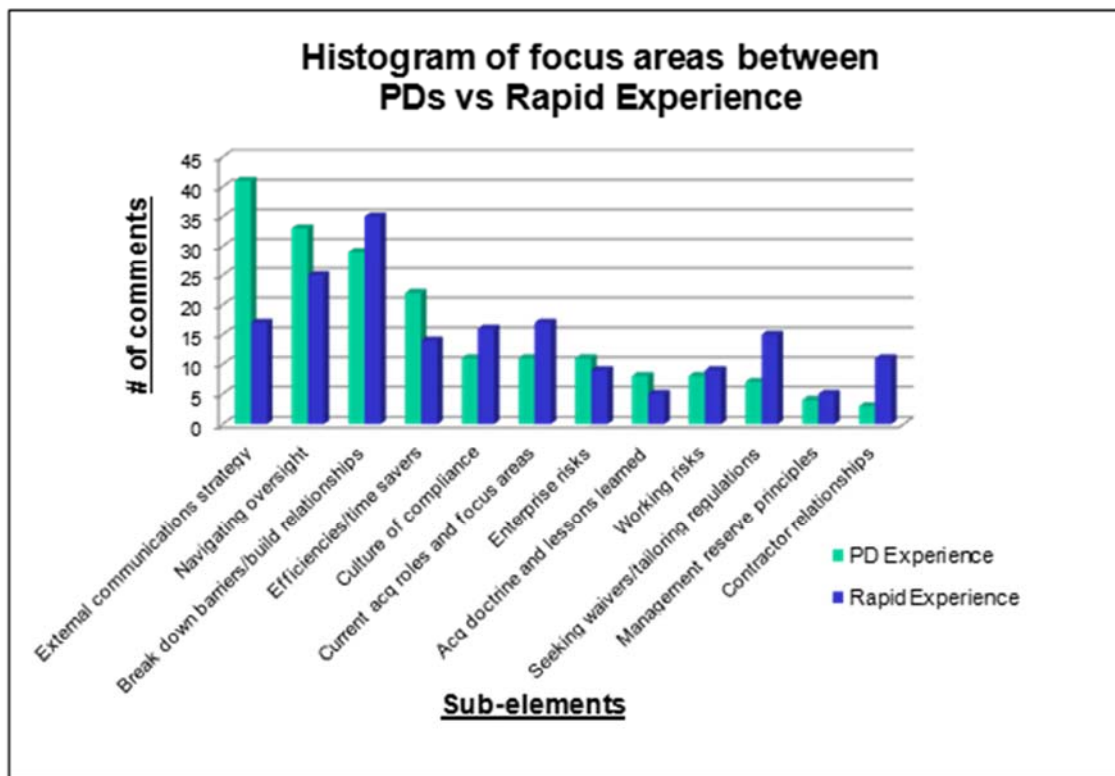


Figure 5. Histogram Comparing PD and Rapid Experience Responses

Additionally, a significant difference also existed between the PD and rapid experience responses for Seeking Waivers/Tailoring Regulations. Rapid acquisition organizations spend a lot of effort on tailoring programs and obtaining waivers. However, program directors often viewed the process of obtaining a waiver as more difficult than actually complying with the guidance, even if it did not make sense for the program. Therefore, program tailoring was a larger focus area for those with rapid acquisition experience. Figure 6 provides a decision-making process to obtain a waiver/tailoring based on the interviews in the "Seeking Waivers/Tailoring Regulations" sub-element.

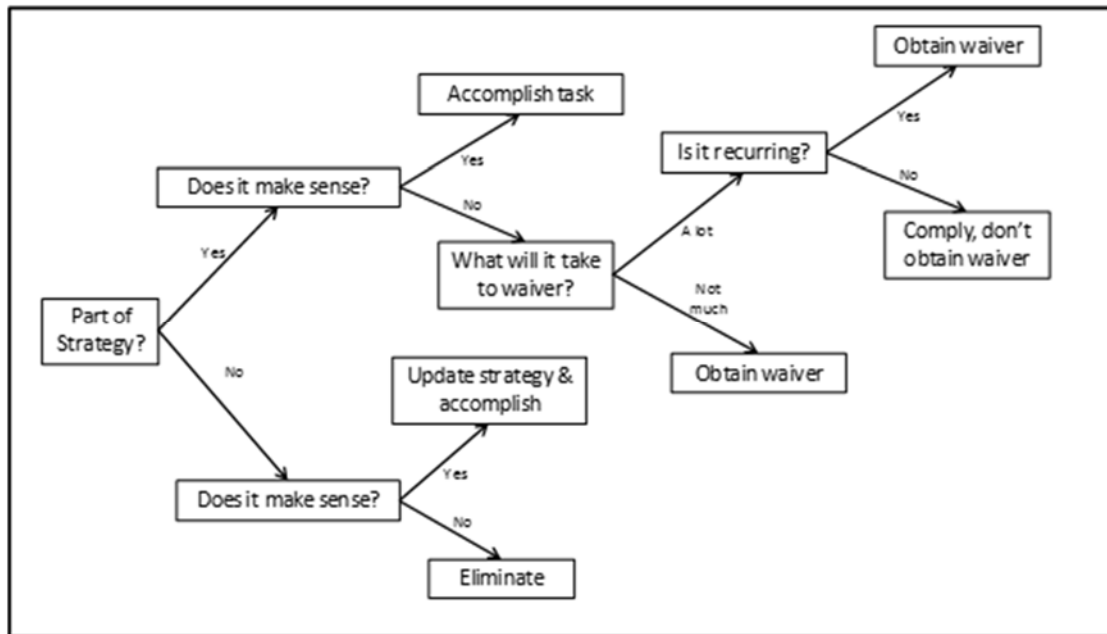


Figure 6. Decision-Making Process to Obtain a Waiver/Tailoring

Survey Analysis

Table 2 shows the overall survey data results divided into junior-level and senior-level responses. Of particular note for the results discussion is the percentage of “unknown” responses from students in each sub-element, some of which were unexpected.

Table 2. Overall Survey Results

<i>Junior Responses</i>				
	Mean	St. Dev	95% C.I.**	% Unknown
Break Down Barriers and Build Relationships	3.746	0.343	3.06-4.43	7.26%
External Communications Strategy	4.088	0.343	3.40-4.77	1.88%
Navigating Oversight	3.551	0.463	2.62-4.48	19.47%

<i>Senior Responses</i>				
	Mean	St. Dev	95% C.I.**	% Unknown
Break Down Barriers and Build Relationships	4.397	0.361	3.68-5	N/A
External Communications Strategy	4.500	0.082	4.34-4.66	N/A
Navigating Oversight	4.056	0.513	3.03-5	N/A

* Threw out Question #3 and #63 -- poorly worded/mis-leading
 ** Junior responses in 95% C.I. (Confidence Interval) range due to Empirical Rule (93 respondents)
 ** Senior responses in 95% C.I. range due to passing Shapiro-Wilk test of normality

An Analysis of Variance (ANOVA) was conducted for each sub-element. Both Break Down Barriers and Build Relationships and Navigating Oversight showed ANOVA significance at the 98% confidence level. Normality is required from both groups for a valid ANOVA test. Normality can be assumed for the students’ responses because a random sample of 93 data points was collected and used (normality requires at least 30 data points

collected at random from the population; McClave, Benson, & Sincich, 2010). However, because only 10 data points were used for the senior leaders group, a Shapiro-Wilk test of normality was conducted on the three sub-elements with significant results. Navigating Oversight showed normality by having a Shapiro-Wilk value greater than 0.05. Initially, normality was not shown for the Break Down Barriers and Build Relationships sub-element, but after investigation one survey response was removed with high confidence that the respondent accidentally reverse coded one of the questions (answered 1 instead of 5 on the Likert scale) based on their interview remarks. After this was done, this sub-element passed the Shapiro-Wilk test, showing normality as well.

Overview of Theme and Sub-Element Results

The three key sub-elements were pulled from the results and are presented next. Figures 7–9 give an overall assessment for each sub-element. The overall assessment consists of two parts. A qualitative assessment rating of 1 to 5 is given based on the interviews and ATLAS.ti analysis (consistency and quantity of quotes, importance placed on quotes, number of co-occurrences, strength of co-occurrences, and other subjective measures). Additionally, quantitative top-level survey results are provided. The average response is on a 1 to 5 Likert scale from the survey, and the percent unknown is the percent of respondents that marked unknown for questions relating to each particular sub-element. Lastly, a “Yes” or “No” is given if the ANOVA test between the Junior and Senior responses for that sub-element was significant.

Theme 1 Sub-Element 1: Break Down Barriers and Build Relationships

Qualitative Assessment: 5		
Survey Results:		
	<u>Junior:</u>	<u>Senior:</u>
Avg response:	3.75	4.40
% Unknown:	7.3%	N/A
ANOVA Significant?		Yes

Figure 7. Overall Assessment for Theme 1 Sub-Element 1

- Building personal, trusting relationships requires consistency and stability
- Importance of following through on your word
- Importance of networking plus solid rationale
- Returning un-executable money builds trust in large programs

Building relationships and trust was the most commonly vocalized point throughout the interviews when discussing how best to navigate oversight or obtain a waiver or tailoring. Building and maintaining strong, trusting relationships with peers, co-workers, superiors, stakeholders, and various members of oversight is a continual process built over time. Trust is increased when project members follow through on their word. Although intuitive, the importance of doing what you say you will do, when you said you would do it, should not be undervalued.

Personal relationships with a high degree of trust require consistency and stability, which is often lacking in major acquisition programs. Air Force military PM tenure is typically a three-year tour for the actual materiel leader billet. Below the PM level, military acquisition



officers and engineers are usually in a program for two years and then do a permanent change of assignment (PCA) in which they switch jobs, which can be within the same program office or not. Even if military members prefer to stay in their assignments, it may not be good for their career to do so. The two years does not include any training, continuous learning, deployments, or additional duties the member might need to complete. One PM the author previously worked with stated the turnover issue clearly. Simply put, they lost half their people every summer, and that was a best case scenario. Worst case, they had a complete turnover one year in which no military continuity existed in a major ACAT I program. Stability and consistency, and the resultant trust and relationships, are constricted by the acquisition assignments process. Alternatively, organizations with a rich history and culture, such as Big Safari, with only three or four directors in the past 60 years, allow for close, personal relationships to be cultivated over time.

Networking is extremely vital to get one's issue "brought to the table." As one respondent mentioned, "I would have never been promoted once in my life if it wasn't about relationships I built relationships, I knew what people wanted, I knew the people to rely on, I did the extra thing, so relationship-building in that oversight process is instrumental." Networking builds trust by building closer relationships. This in turn increases the likelihood for a program approval, waiver, or tailoring. However, some negative aspects of networking were cited in the interviews as well. When one becomes more senior and is on their second or third tour at the same base, the people who have previously known them may still view them as their company grade officer (CGO) friend and not show the requisite respect. Additionally, past co-workers may not be as concerned about deadlines because they have a personal relationship with the senior. Last, the ease of recognizing "phony networking" was cited in a couple interviews, which is when one realizes someone is building a relationship solely for their own benefit. Although drawbacks to networking exist, the positive aspects far outweigh the drawbacks.

Building relationships is enabled by knowing what you are doing. Even if all the previous statements were true, if the rationale for what you are trying to do is flimsy, trust and networking will be far less effective. Having solid rationale in your decision-making is a key enabler to building trust because others may not want to enable members of their own network to assist in doing something that does not make sense if it will result in a lower trust level for them. As one respondent discussed, "Having a sense of purpose, knowing what you're trying to do, and having strong rationale communicates a message much better."

Lastly, returning un-executable money builds trust in large programs, if they are behind schedule and must do so. The money must be returned through the PEO, not directly to Air Force or other channels. Returning un-executable money does not include "expired" funds.

In this sub-element, the responses between the students and senior leaders were significantly different. The mean of the senior responses was 4.40 compared to a mean of 3.75 for students. As was briefed to each FAM and IPM class, the senior leaders emphasized and put much more value on relationship-building, building trust, and networking than did the students. The takeaway for the students is that as they are starting out or continuing their careers, they should begin building relationships with folks in required trainings, other programs, outside of work, etc., to expand their network. Of course, this cannot be done from a selfish or "further myself" point of view, but rather should be genuinely for the benefit of all.

In summary, as one respondent discussed, "What do I do to navigate [oversight]? I try to break down those barriers as much as possible. I really try to build relationships with



people, so that they know if something is really bugging them they can give me a call so we can talk back and forth.”

Theme 1 Sub-Element 2: External Communications Strategy

Qualitative Assessment: 5		
Survey Results:		
	<u>Junior:</u>	<u>Senior:</u>
Avg response:	4.09	4.5
% Unknown:	1.9%	N/A
ANOVA Significant?		No

Figure 8. Overall Assessment for Theme 1 Sub-Element 2

- “Walking the building” every time
- Benefits of physical communications
- “Ground swell” or “burning your boots”
- Value of an elevator speech
- Knowing and communicating the “views of others”
- Ability to communicate across paradigms

Once a decision is made as to the strategy on an issue, how the PM externally communicates and “sells” what they’re doing is very important. Several interviewees provided approaches they take. These include “walking the building” each time the PM is at the Pentagon, physical communications, and “ground swell” or “burning your boots” (proactive staff communication and dissemination of program strategies). Also, the value of an elevator speech, knowing the “views of others,” and the ability to communicate across paradigms all go a long way toward effectively communicating what the program is trying to accomplish. Additionally, this sub-element had over a 2:1 ratio of responses from program directors versus respondents with rapid experience. In general, those with PD experience put much more emphasis into the importance and value of communicating what they are doing. The likely reason for this is because large ACAT I programs experience much more oversight (due to the multi-year, high-dollar value, and industry and congressional stakeholders) than smaller, more rapid programs. However, in ACAT I programs, decision-making and oversight require more stakeholder analysis and often consist of a “one-shot” opportunity to obtain program approvals, thus leading to the higher importance of the program’s external communications strategy from program directors.

Several respondents mentioned how they “walk the building” when they are visiting Washington, DC. This term is used to describe how a PM should visit key stakeholders, members of oversight, and members of their network when walking around the Pentagon. In particular, they should do this each time they are there, especially when nothing is needed from the people they are visiting. Visiting offices and asking folks if they need anything from you helps build trust and, with noble intent all along, can enable reciprocal generosity when you need something from them. In other words, a genuine, proactive offer to help others without any expectation for them to reciprocate in the future is an effective communication strategy to build long-term relationships.



Additionally, physical communications are far better than electronic means. Physical communications enable one to match a face with a name, increase the importance of the issue (if one flies to discuss an issue rather than e-mailing or calling, they are putting higher importance on the issue), and make it more difficult to ignore the issue. Ignoring an e-mail is fairly easy and ignoring a phone call is not much harder. However, when someone physically visits you to discuss an issue, and then comes back to discuss the results, it is far more difficult to ignore that person's requests.

Another way to externally communicate a strategy is by "ground swell" or "burning your boots." This refers to the program staff, predominantly the Program Element Monitor (PEM), proactively communicating and disseminating the strategy and goals throughout the myriad program stakeholders in Washington, DC. This is done by working the staffing and issues from the ground up, communicating to all stakeholders and staffs first so that there are no surprises and so that any possible issues are brought to light early on. As one respondent mentioned, "really good action officer work can save hours upon hours of wasted time in meetings."

Business, organizational behavior, and management books often discuss the importance of an elevator speech (albeit using different terms). The premise is that if you were to find yourself riding in an elevator with a senior manager, you should always have a short (~1–2 minute) speech or talking points in mind to gain the senior manager's support in the time it takes to ride in the elevator. Interviewees discussed the importance of this concept in acquisitions as well, with some discussing the value of a hard-hitting one-liner. PMs need to have a short, direct, and effective means to communicate the program capability and its vital importance without going into highly technical or programmatic details. As one respondent said, "When I was having a problem getting funding for xx program, I met with a key staffer. I said to him 'Do you want our enemies to be able to launch a nuke at us and we're not able to detect it early enough to destroy it?'" 'Well, no.' 'This program ensures early warning to protect the homeland. Period.'" These statements should be clear and concise to the maximum extent possible. An excellent one-liner can be crucial for three reasons:

1. if one unexpectedly has a moment of the senior's time;
2. to translate a technical program into a tangible, national security issue; and
3. in helping the oversight help the program.

Staff Summary Sheets (SSS) have a section in which the "views of others" can be documented. The purpose is to provide any differing views amongst various stakeholders, specifically influential stakeholders, when staffing a package. Bringing contentious viewpoints to the table early in the process has several benefits. It allows you to

1. take the time to grasp the heart of an issue and what you want to transmit,
2. clearly articulate your position, and
3. clearly articulate the views of others.

Once this is done, the package gets sent up the chain. The structure of an SSS allows for clear communications on paper rather than dealing with the myriad information, or often mis-information (as one respondent discussed), that goes through e-mail. Additionally, "if you don't accept or work those views of others from the get go, by the time you end up briefing your leadership, and then your leadership's leadership, you end up entrenched in a position and you end up entrenched so much that it's hard to walk backwards from anymore. So it removes your flexibility from a compromise or otherwise." Although it often works out



in the end, it can be quite painful to go back several layers in the staffing process and the resultant coordination change when a relatively small or easy change could have been accomplished, provided it was worked up front.

When discussing how best to communicate or “sell” an issue, it is very important to communicate across paradigms. Providing information in a way that program managers, users, budgeters, engineers, and senior leaders in oversight all understand will help prevent confusion and delays, particularly in the staffing process. Similar to knowing your audience when giving a briefing, generally it is beneficial for a PM to know the audience for each particular briefing, meeting, and document and tailor the product to the audience. A briefing inundated with technical jargon and specifications is probably not best when providing program status to the user or a senior leader.

Theme 2 Sub-Element 3: Navigating Oversight

Qualitative Assessment: 5		
Survey Results:		
	<u>Junior:</u>	<u>Senior:</u>
Avg response:	3.55	4.06
% Unknown:	19.5%	N/A
ANOVA Significant?		Yes

Figure 9. Overall Assessment for Theme 2 Sub-Element 3

- Pick and choose battles while preventing “blood in the water”
- Acquisition oversight lacks government PM experience
- Reduce oversight by executing the plan
- Smartly defend program budgets

This sub-element discusses creative practices in working with oversight. Current oversight also has several shortcomings. To be expected, senior leaders had a significant difference in responses to the importance of navigating oversight than did students. Seniors placed more emphasis on how to creatively navigate oversight, especially the subset of senior leaders with program director experience.

First, acquisition experience is lacking in acquisition oversight positions. Political appointees often come from industry, but as one respondent commented, “I’ve been to all the schools you’re supposed to, and they always talk about how industry does things. Industry and government are simply very different, and the same approaches will not work for both.” Respondents also noted that the inexperience results in a lack of urgency. Techniques to work with inexperienced oversight include clearly making your case for what you are doing and laying out when a decision must be made (and the rationale and outcomes if a decision is not made by then). If this does not work, allies either up the chain or in other oversight positions must be gained to defend and promote your position. An operations advocate at the MAJCOM or HQ level was cited as an extremely beneficial/influential ally. Operations advocates will defend the program’s requirements, criticality, and need as the user, rather than the program office defending its own jobs.



Also, one way to reduce program oversight is to reduce the ACAT level of the program whenever possible. For example, ten \$100 million programs have much fewer reporting requirements than one \$1 billion program. This will allow each program to be smaller and leaner, and have less oversight (all else held equal). One ACAT 1D program noted how the documentation requirements for a milestone review have become debilitating—96 documents containing 12,000+ pages. As the literature review showed, increasing a program's classification level reduces oversight as well. However, both a program's classification and ACAT level are determined by either law (for the ACAT level) or strict policies (classification level); therefore, a PM has little authority to change these after program conception.

When navigating oversight, PMs must pick and choose their battles on the few issues on which they are not willing to compromise. This will reinforce to the community what is not negotiable from the PM's point of view. Correlated to this, one must prevent "blood in the water" during decision reviews. This refers to a stakeholder or staff member attacking controversial issues of the program during a meeting. The PM must directly and convincingly quell these arguments so that other stakeholders do not latch on, much like sharks when there's blood in the water. For example, if a stakeholder questions the reasoning for the contract type in the acquisition strategy, the PM should then and there explain why it is the best contract type and incentive structure for the program. A hesitant answer or having to get back to the stakeholder later allows for other stakeholders to look into the issue and lose confidence in the PM having the requisite control and understanding of the program. Of course, this needs to be tempered with difficult, unforeseen questions that do not have a known answer. In these (hopefully rare) cases, a PM should promise to get back to the person as quickly as possible. In summary, keeping the "blood out of the water" can be immensely beneficial.

Practices in which programs defend their budgets (with integrity) reduce program oversight as well. The best way to defend against budget cuts and reduce intervention is simply to stay green—obligate and expend money on time. Second, programs should make every effort to fund disconnects internally, as no one ever wants to ask for more money (nor is it currently available). The 19.5% unknown responses from students in this sub-element arise predominantly from this survey question. Surprisingly, 40% of students did not know if programs should fund disconnects internally to the maximum extent possible. Therefore, it is recommended that the appropriate continuing education course expand the teaching on how PMs can avoid program interference by smartly managing funds internally. Although this is of particular value to program directors, PMs at all levels can still learn from this heuristic and do what they can to manage funds allowing for some degree of flexibility. Third, perceptions are worse than reality in many areas of government acquisitions. If a program is perceived to be fat (over-funded) or behind schedule, whether it is true or not, the program is a more apt candidate for cuts.

Also, when hiring a material leader, some programs may find it highly beneficial to hire one with recent PEM experience. For example, a pre-Milestone B program (even though it is not technically called a program yet) will experience numerous decision reviews, staffing, and oversight during the Milestone B and source selection processes. Recent PEM experience greatly increases the process familiarity and likelihood that recent relationships will prove useful in working the system.

Conclusions

In review, the predominant finding of this research is that senior acquisition professionals believe that relationships and building trust are of paramount importance. A high correlation exists between three main sub-elements: Break Down Barriers and Build



Relationships, External Communications Strategy, and Navigating Oversight. The first two are vital to effectively and efficiently navigating oversight. Both program directors and respondents with rapid experience chose these three sub-elements as their top three responses.

For Navigating Oversight, program directors more often accepted the level of oversight as a fact of life, so they work hard to efficiently work with and through the oversight for program success. However, rapid acquisition organizations navigated the oversight process by delegating approval authorities and tailoring programs from the start, thus avoiding a degree of oversight from the beginning.

Additionally, junior personnel did not believe the relationships nor the oversight aspects to be as important as the senior leaders judged. Therefore, an opportunity exists for DAU or AFIT classes to bolster the material relating to these topics. This is especially important not only because the senior leaders attribute success to these areas, but because relationships can be built over a career and the process of building relationships can begin at the start of one's acquisition journey.

Recommendations for Future Research

The following are recommendations for future research. Future research can be accomplished to investigate the root cause of the significant differences shown between introductory, mid-level, and senior acquisition professionals, both for differences in the Likert scale responses and for questions with a significant number of "unknown" responses. Additionally, the same thesis methodology could be applied to industry program managers to assess the external validity of this research to industry.

References

- Acker, D. D. (1993). *Acquiring defense systems: A quest for the best*. Fort Belvoir, VA: Defense Systems Management College (DSMC) Press.
- Auerbach, C. F., & Silverstein, L. B. (2003). *Qualitative data: An introduction to coding and analysis*. New York, NY: New York University Press.
- Augustine, N. (1997). *Augustine's laws*. Reston, VA: American Institute of Aeronautics and Astronautics.
- Binder, M., & Edwards, J. S. (2010). Using grounded theory method for theory building in operations management research: A study on inter-firm relationship governance. *International Journal of Operations and Production Management*, 30(3), 232–259.
- Bodilly, S. J. (1993). *Case study of risk management in the USAF B-1B bomber program*. Santa Monica, CA: RAND.
- Burton, J. G. (1993). *The Pentagon wars: Reformers challenge the old guard*. Annapolis, MD: Naval Institute Press.
- Cohen, J. (1992). Quantitative methods in psychology: A power primer. *Psychological Bulletin*, 112(1), 155–159.
- De Wit, A. (1988). Measurement of project success. *Project Management*, 6(3), 164–170.
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, 14, 532–550.
- Ellram, L. M. (1996). The use of the case study method in logistics research. *Journal of Business Logistics*, 17(2), 93–138.
- Ford, J. S., Colburn, R. M., & Morris, Y. A. (2012). *Principles of rapid acquisition and systems engineering* (Graduate research project). Air Force Institute of Technology, WPAFB, OH.



- Kadish, R., et al. (2006). *Defense acquisition performance assessment*. Washington, DC: Department of Defense.
- Knue, T. G. (1991). *Oversight of and within the Department of Defense: Is it becoming counterproductive?* (Unpublished master's thesis). Air Force Institute of Technology, WPAFB, OH.
- Krathwohl, D. R. (1997). *Methods of educational and social science research: An integrated approach* (2nd ed.). Reading, MA: Addison-Wesley.
- McClave, P., Benson, G., & Sincich, T. (2010). *Statistics for business and economics* (11th ed.). Upper Saddle River, NJ: Pearson.
- Miller, M. C., & Williams, E. T. (1993). *Oversight of the C-17: A case study* (Unpublished master's thesis). Air Force Institute of Technology, WPAFB, OH.
- Murdock, C.A., et al. (2005). *Beyond Goldwater-Nichols: U.S. government and defense reform for a new strategic era* (Phase 2 report). Washington, DC: Center for Strategic and International Studies.
- Neal, M. J. (2004). *Establishing a foundation to capture the cost of oversight for a major defense program within the information technology acquisition community* (Unpublished master's thesis). Air Force Institute of Technology, WPAFB, OH.
- Pagliano, G. J., & O'Rourke, R. (2004). *Evolutionary acquisition and spiral development in DoD programs: Policy issues for Congress*. Fort Belvoir, VA: CRS.
- Patten, M. L. (2009). *Understanding research methods: An overview of the essentials* (7th ed.). Glendale, CA: Pyrczak Publishing.
- Yukl, G. (2006). *Leadership in organizations*. Upper Saddle River, NJ: Prentice-Hall.





ACQUISITION RESEARCH PROGRAM
GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY
NAVAL POSTGRADUATE SCHOOL
555 DYER ROAD, INGERSOLL HALL
MONTEREY, CA 93943

www.acquisitionresearch.net